Massimo A. Bollasina

CONTACT INFORMATION

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EDUCATION

Ph.D., Atmospheric and Oceanic Science, University of Maryland, College Park — 2005 - 2010
Thesis: *Surface and Aerosol Effects on the South Asian Monsoon Hydroclimate*
Advisor: Sumant Nigam

Laurea (M.S. equivalent) "*magna cum laude*", Physics, University of Milan, Italy — 1988 - 1994
Thesis: *Study of Transport, Dispersion and Precipitation of Effluents from Cooling Towers*

AWARDS

Norbert Gerbier-MUMM International Award, World Meteorological Organization — 2013

Outstanding Oral Presentation among Early Career and Young Scientists, WCRP Open Science Conference: Climate Research in Service to Society, Denver, CO — 2011

Best Doctoral Dissertation, Department of Atmospheric and Oceanic Science, U. Maryland — 2010

Green Fellowship Fund in Global Climate Change, U. Maryland — 2009

Best Student Seminar, Department of Atmospheric and Oceanic Science, U. Maryland — 2008

Ann G. Wylie Dissertation Fellowship, U. Maryland — 2008 - 2009

Graduate Research Assistantship, Dept. of Atmospheric and Oceanic Science, U. Maryland — 2005 - 2010

RESEARCH EXPERIENCE

Postdoctoral Research Associate — 2010 - present
Geophysical Fluid Dynamics Laboratory, Princeton, NJ
(supervisors: Yi Ming and V. Ramaswamy)

- *Investigated the role of aerosols in inducing changes in circulation and hydroclimate of the South Asian summer monsoon*

- *Investigated the role of key physical processes (air-sea interactions over the Indian Ocean, land-atmosphere coupling over India) in driving the observed and simulated monsoon annual cycle*

Graduate Research Assistant 2005 - 2010
Department of Atmospheric and Oceanic Science, University of Maryland College Park
- *Investigated the variability of the hydrological cycle of the South Asian summer monsoon and its forcing mechanisms, specifically the role of aerosols and of land-ocean-atmosphere interactions*

Visiting Scientist 2005
Experimental Climate Prediction Center, Scripps Institution of Oceanography,
University of California, San Diego (supervisor: John Roads)
- *Investigated the role of soil moisture anomalies and associated land-atmosphere interactions in driving regional climate variability over North America*

Researcher, Research Group Coordinator 1995 - 2004
Epson Meteo Center, Milan, Italy
- *Conducted global and regional numerical modeling studies of the atmosphere on a wide range of topics (cloud microphysics, planetary boundary layer, turbulence, regional-scale atmospheric circulation, South Asian monsoon)*
- *Implemented and developed numerical models of the atmosphere for short to long-range weather forecasts*
- *Analyzed the atmospheric circulation by means of observations, global datasets, model output*

Scientific expeditions to above 5000 m in the Khumbu Valley, Nepal Himalayas 2000 - 2002
- *Planned and installed a network of five high-altitude permanent automated weather stations, collected and validated measurement data, with extended permanence at the Pyramid Observatory/Laboratory (5010 m)*

TEACHING/MENTORING EXPERIENCE

Guest Lecturer, AOSC620, Department of Atmospheric and Oceanic Science (UMD) Nov. 2008
"The Growth of Cloud Droplets in Uniformly Upward-Moving Air: Basic Concepts"

Advisor for a M. Sci. thesis in Environmental Sciences (University of Milan) 2004
"The use of satellite observations in modern climate research"

Guest Lecturer, Department of Environmental Sciences (University of Milan) April 2002
"Numerical Weather Prediction Models"

Advisor for more than 10 (M.S. equivalent) theses in Atmospheric Science 1997 - 2001
Department of Physics (University of Milan)
- A *three-dimensional planetary boundary layer model; sensitivity to surface parameters*
- *A cloud microphysics model and precipitation development in idealized cases*
- *An advanced turbulence closure parameterization scheme and three-dimensional circulation in idealized cases*
- *A model for the urban heat island and influence of surface parameters*

- *A model and case studies of pollution transport and dispersion over complex orography*
- *Adaptation of an ocean model to the Mediterranean basin*
- *Three-dimensional atmospheric regional circulation models and case studies*
- *El-Niño and NAO effects over Europe*
- *Characterization of the Indian monsoon climate in relation to the long-range transport of pollutants*

PUBLIC OUTREACH EXPERIENCE

Numerous presentations at public events — 2000 - 2004
"Research at high-altitude in the Himalayas", "The South Asian monsoon", "Climate change"

RESEARCH GRANTS

Italian Ministry of University, Scientific and Technological Research (MURST) — 2000 - 2005
"Study of meteorological and climatological characteristics of the Himalayas and relationship with long-range transport and dispersion of pollutants"

SERVICES

Reviewer (~15/year) — 2009 – present
Nature, Journal of Climate, Journal of Climate and Applied Meteorology, Climate Dynamics, Proceedings of the National Academy of Sciences, Meteorology and Atmospheric Physics, Geophysical Research Letters, Journal of Geophysical Research, Journal of Hydrometeorology, Atmospheric Chemistry and Physics, Atmospheric Research, Geoscientific Model Development, Bulletin of Glaciological Research, Science of the Total Environment

Grant Reviewer — 2010 – 2011
US Department of Energy (DOE)/Atmospheric System Research (ASR), US National Science Foundation (NSF), UK Natural Environment Research Council (NERC)

Host for the GFDL Thursday Seminar Series — 2011

Representative at the Univ. of Maryland Graduate Student Government — 2008 – 2009

Organizer and Chairman — 2003
CEOP/GEWEX Workshop "The role of the Himalayas and the Tibetan Plateau within the Asian monsoon system", Milan, Italy

OTHER QUALIFIED EXPERIENCE/COLLABORATIONS

Member CEOP Inter-monsoon Model Study (CIMS) Group — 2001 – 2005

World Climate Research Programme/Coordinated Enhanced Observing Period (WCRP/CEOP)

Principal Investigator "Himalayas Reference Site" 2000 – 2005
World Climate Research Programme/Coordinated Enhanced Observing Period (WCRP/CEOP)

Principal Investigator 1998 – 2004
"Study of meteorological and climatological characteristics of the Himalayas and relationship with long-range transport and dispersion of pollutants", in collaboration with the Water Research Institute/National Research Council (IRSA/CNR) and the Ev-K2-CNR Committee

Developer of the Atmospheric Pollutant Dispersion Software "Modelli!2" 1997 - 1999
LSI-LASTEM, Milan

MEMBERSHIPS

American Geophysical Union 2005 – present

American Meteorological Society 2008 – present

ARTICLES IN PREPARATION

Bollasina, M., and Y. Ming, 2012: Forced changes in the South Asian monsoon annual cycle: processes at play. In preparation for *J. Climate*.

Ming, Y., and **M. Bollasina**, 2012: Tropical versus extratropical aerosol forcing on the South Asian monsoon. In preparation for *J. Climate*.

PEER-REVIEWED ARTICLES

Bollasina, M., and Y. Ming, 2012: The South Asian monsoon onset in an idealized setting: unsteady response driven by land-atmosphere processes. Submitted to *Climate Dyn*.

Bollasina, M., and Y. Ming, 2012: The general circulation model precipitation bias over the southwestern equatorial Indian Ocean and its implications for simulating the South Asian monsoon. *Climate Dyn.* (In press).

Bollasina, M., Y. Ming, and V. Ramaswamy, 2011: Anthropogenic aerosols and the weakening of the South Asian summer monsoon. *Science,* **334**, 502-505.

Bollasina, M., A. M. B. Nunes, and J. O. Roads, 2011: North American summertime climate simulation: soil moisture-atmosphere interactions. *J. Hydromet.* (under revision).

Nigam, S., and **M. Bollasina**, 2011: Reply to comment by K. M. Lau and K. M. Kim on "'Elevated heat pump' hypothesis for the aerosol-monsoon hydroclimate link: 'Grounded' in observations? *J. Geophys. Res.,* **116**, D07204, doi:10.1029/2010JD015246.

Bollasina, M., and S. Nigam, 2011: Regional Hydroclimate Change over the Indian Subcontinent: Impact of the Expanding Thar Desert on the Summer Monsoon. *J. Climate,* **24**, 3089–3106.

Bollasina, M., and S. Nigam, 2010: The Summertime "Heat" Low over Pakistan/Northwestern India: Evolution and Origin. *Climate Dyn.,* 10.1007/s00382-010-0879-y.

Nigam, S., and **M. Bollasina**, 2010: The "Elevated Heat Pump" Hypothesis for the Aerosol-Monsoon Hydroclimate Link: "Grounded" in Observations? *J. Geophys. Res.*, **115**, D16201, doi:10.1029/2009JD013800.

Bollasina, M., and S. Nigam, 2009: Absorbing Aerosols and Pre-Summer Monsoon Hydroclimate Variability over the Indian Subcontinent: The Challenge in Investigating Links. *Atmos. Res.*, **94**, 338-344, doi:10.1016/j.atmosres.2009.06.008.

Bollasina, M., and S. Nigam, 2008: Indian Ocean SST, evaporation, and precipitation during the South Asian Summer Monsoon in IPCC-AR4 coupled simulations. *Climate Dyn.*, 10.1007/s00382-008-0477-4.

Bollasina, M., S. Nigam, and K.-M. Lau, 2008: Absorbing aerosols and summer monsoon evolution over South Asia: An Observational Portrayal. *J. Climate*, **21**, 3221-3239.

Bollasina, M., and S. Benedict, 2004: Coordinated Enhanced Observing Period/Global Water and Energy Cycle Experiment Workshop: The Role of the Himalayas and the Tibetan Plateau within the Asian Monsoon System. *Bull. Amer. Met. Soc.*, **85**, 1001-1004.

Bollasina, M., L. Bertolani, and G. Tartari, 2002: Meteorological observations in the Khumbu Valley, Nepal Himalayas: 1994-1999. *Bull. Glac. Res.*, **19**, 1-11.

Bertolani, L., **M. Bollasina**, and G. Tartari, 2000: Recent biennial variability of meteorological features in the eastern highland Himalayas. *Geophys. Res. Lett.*, **17**, 2185-2188.

OTHER ARTICLES

Bollasina, M., and S. Nigam, 2011: Increasing desertification of Northwestern India can adversely impact the South Asian monsoon. *GEWEX News,* **21**, 8-10.

Bollasina, M., and S. Nigam, 2009: A new pathway for absorbing aerosols' influence on the interannual variability of the South Asian monsoon. *GEWEX News*, **19**, 10-11.

Bollasina, M., and K. Ueno, 2004: Current Research over the Himalayas and the Tibetan Plateau under CEOP. *UCLA Tropical Meteorology and Climate Newsletter*, **65**.

Bollasina, M., J. Matsumoto, and S. Benedict, 2003: The role of the Himalayas and the Tibetan Plateau within the Asian Monsoon System. *CEOP Newsletter*, **4**.

Lau, W. K.-M., J. Matsumoto, **M. Bollasina**, and H. Berbery, 2003: Diurnal variability in the monsoon region: preliminary results from the CEOP Inter-Monsoon Studies (CIMS). *CEOP Newsletter*, **5**.

Bertolani, L., **M. Bollasina**, G. P. Verza, and G. Tartari, 2000: *Pyramid Meteorological Station – Summary Report 1994-1998*. Milan.

BOOKS CHAPTERS

Bollasina, M., and A. Perotto, 2003: *Medium to long-range weather forecasting and climate models*. In: Handbook on Meteorology. Ed. Alphatest, Milan, pp. 565-597 (in Italian).

PROCEEDINGS

Bollasina, M., and S. Nigam, 2009: *Observational Evidence for Absorbing Aerosols' Influence on the South Asian Summer Monsoon. Are Coupled Models Ready for Probing Mechanisms?* Proc. 89th AMS Annual Meeting, Phoenix, AZ, 11-15 January 2009.

Bollasina, M., A. Nunes, J. Roads, M. Kanamitsu, 2005: *Regional Climate Simulations over the US and the role of Surface Water in Atmospheric Predictability.* Proc. 1st CEOP/IGWCO Meeting, Tokyo, 28 February – 4 March 2005.

Bollasina, M., and L. Bertolani, 2004: *Winter snow events over the Himalayas. Observations and simulations during CEOP EOP-3*. Proc. Joint AOGS 1st Annual Meeting & 2nd APHW Conference, Singapore, 5-8 July 2004.

Bollasina, M., L. Bertolani, and G. Tartari, 2002: *Simulations of the 2001 Indian summer monsoon onset with a general circulation model*. Proc. IEMSS-2002 Conference, Lugano (Switzerland), 24-27 June 2002.

Bollasina M., L. Bertolani, and G. Tartari, 2001: *Study of Local and Large-Scale monsoon Circulation in the eastern highland Himalayas*. Proc. 5th International Study Conference on GEWEX in Asia and GAME, Nagoya (Japan), 3-5 October 2001.

Bertolani L., **M. Bollasina**, and G. Tartari, 2001: *Recent Meteorological Studies in the Eastern Highland Himalayas*. Proc. of the Interdisciplinary Mountain Research Young Scientists Conference, Stelvio (Italy), 25-28 September 2001.

TALKS AND MEETINGS

"*The South Asian summer monsoon: an ideal test-bed for exploring (observed/simulated) physical processes in the climate system*", Department of Earth System Science, University of California, Irvine, 15 May 2012 (Invited).

"*Multi-faceted forced variability of the South Asian summer monsoon*", Department of Atmospheric and Oceanic Science, University of Maryland College Park, 10 May 2012 (Invited).

"*Asian monsoon in AM3*", Joint GFDL-NCAR Atmospheric Modeling Meeting, Princeton, 4 May 2012.

"*Anthropogenic aerosols and the weakening of the South Asian summer monsoon*", Institute for Terrestrial and Planetary Atmospheres, School of Marine and Atmospheric Sciences, Stony Brook University, NY, 29 February 2012 (Invited).

"*The South Asian Monsoon Onset in An Idealized Setting: Unsteady Response Driven by Land-Atmosphere Processes*", 24th Conference on Climate Variability and Change, 92nd American Meteorological Society Annual Meeting, New Orleans, LA, 22-26 January 2012.

"*Anthropogenic Aerosols and the Weakening of the South Asian Summer Monsoon*", CICS Review, Princeton, 3 November 2011.

"*Precipitation Bias over the Western Indian Ocean in an Atmospheric GCM: Role of the Meridional SST Gradient*", WCRP Open Science Conference: Climate Research in Service to Society, Denver, CO, 24-28 October 2011.

"*Anthropogenic Aerosols and the Weakening of the South Asian Summer Monsoon*", WCRP Open Science Conference: Climate Research in Service to Society, Denver, CO, 24-28 October 2011.

"*Anthropogenic Aerosols and the Weakening of the South Asian Summer Monsoon*", Gordon Research Conference: Clouds, Aerosols, Precipitation and their Role in Climate and Climate Change, Waterville, ME, 10-15 July 2011.

"*Multi-faceted forcing on the South Asian monsoon*", GFDL Informal Lunchtime Seminars, Princeton, 19 May 2011.

"*The Expanding Thar Desert: a Modeling Study of its Impact on the South Asian monsoon*", AOS Monday Lunch Seminars, Princeton, 9 May 2011.

"*Precipitation Bias over the Western Indian Ocean in an Atmospheric General Circulation Model: Implications for Studying Changes in South Asian Summer Monsoon*", 23rd Conference on Climate Variability and Change, 91st American Meteorological Society Annual Meeting, Seattle, WA, 23-27 January 2011.

"*Modeling of Regional Hydroclimate Change over the Indian Subcontinent: Impact of the Expanding Thar Desert*" Michio Yanai Symposium, 91st American Meteorological Society Annual Meeting, Seattle, WA, 23-27 January 2011.

"*The summertime "heat" low over Pakistan/Northwestern India: Evolution and origin*" Michio Yanai Symposium, 91st American Meteorological Society Annual Meeting, Seattle, WA, 23-27 January 2011.

"*Modeling of Regional Hydroclimate Change over the Indian Subcontinent: Impact of the Expanding Desert*". Graduate Research Interaction Day (GRID), University of Maryland, 7 April 2010.

"*The heat low over Pakistan/northwestern India: spatiotemporal evolution and forcing mechanisms*". 22nd Conference on Climate Variability and Change, 90th American Meteorological Society Annual Meeting, Atlanta, GA, 16-21 January 2010.

"*Aerosol and Surface Effects on South Asian Monsoon Hydroclimate*". NOAA/GFDL, Princeton, NJ, 3 November 2009.

"*Local Air-Sea Interactions in the Indian Ocean in Coupled Models*." IAMAS - IAPSO - IACS Joint Assembly (MOCA-09), Montreal, Canada, 19-24 July 2009.

"*Observational Evidence for Absorbing Aerosols' Influence on the South Asian Summer Monsoon. Are Coupled Models Ready for Probing Mechanisms?*" Special Symposium on Aerosol-Cloud-Climate Interactions, 89th American Meteorological Society Annual Meeting, Phoenix, AZ, 11-15 January 2009.

"*Local Air-Sea Relationship in the Indian Ocean during the South Asian Summer Monsoon in Coupled Simulations*". Department of Atmospheric and Oceanic Science (UMD), 5 November 2008.

"*Observations Reveal a New Pathway for Absorbing Aerosols Influence on the South Asian Monsoon*". Department of Atmospheric and Oceanic Science (UMD), 30 April 2008.

"*A Study of the Interaction of Surface Water with the Atmosphere in a Regional Spectral Model*", by M. Woodard*, J. Roads, A. Nunes, and M. Bollasina, *presented at the 7th International RSM workshop, Israel, 10-14 July 2006.

"*Validation of numerical model forecast of precipitation and satellite-derived rainfall estimates over Europe*", by L. Bertolani*, M. Bollasina and A. Airoldi, *presented at the International Summer School on Atmospheric and Oceanic Sciences (ISSAOS) 2005, L'Aquila, Italy, 29 August – 2 September 2005.

"*Surface Water-Atmosphere Feedbacks in US Climate Simulations using the Regional Spectral Model*", by M. Woodard*, M. Bollasina, A. Nunes, J. Roads, *presented at the 6th International RSM workshop, New York, 11-15 July 2005.

5th International Scientific Conference on the Global Energy and Water Cycle, Irvine (California), 20-24 June 2005.

"*Impact of surface water anomalies on US climate*", ECPC Advisory Committee Meeting, La Jolla (California), 17 June 2005.

"*Regional Climate Simulations over the US and the role of Surface Water in Atmospheric Predictability*", 1st CEOP/IGWCO Joint Meeting, Tokyo (Japan), 28 February – 4 March 2005.

"*Orography and Monsoons: winter snow-storms over the Himalayas*", 1st CEOP/IGWCO Joint Meeting, Tokyo (Japan), 28 February – 4 March 2005.

"*Winter snow events over the Himalayas: Observations and simulations during CEOP EOP-3*", CEOP/CIMS Workshop on Monsoon Systems of the Americas, Montevideo (Uruguay), 17-18 September 2004.

10th GEWEX Hydrological Panel Meeting, Montevideo (Uruguay), 13-16 September 2004 (Invited).

The 4th International Symposium on the Tibetan Plateau, Lhasa (Tibet, China), 4-7 August 2004.

"*Winter snow events over the Himalayas: Observations and simulations during CEOP EOP-3",* Joint AOGS 1st Annual Meeting & 2nd APHW Conference, Singapore, 5-8 July 2004 (Invited).

"*The Himalayas and the Tibetan Plateau and their dynamical and thermal influence on the variability of the Asian monsoon; the CEOP perspective*", Department of Atmospheric Sciences, UCLA (Invited by Prof. Emeritus Michio Yanai), 17 March 2004.

CEOP 3rd Implementation Planning Meeting, Irvine, CA, 10-12 March 2004.

"Some considerations on modeling the monsoon over the Himalayas and the Tibetan Plateau", CEOP Model Output Development and Analysis Workshop, University of California at Irvine, CA, 8-9 March 2004.

Interdisciplinary Summit of the Ev-K^2-CNR Project, Pallanza (Italy), 26 February 2004.

EGS - AGU - EUG Joint Assembly, Nice (France), 6-11 April 2003.

CEOP/GEWEX Workshop on "The role of the Himalayas and the Tibetan Plateau within the Asian monsoon system", Milan, 7-8 April 2003.

CEOP 2nd Implementation Planning Meeting, Berlin, 2-4 April 2003.

CEOP Reference Site Managers Workshop, Berlin, 31 March – 1 April 2003.

"*Simulations of the 2001 Indian Summer Monsoon Onset with a General Circulation Model*", Assembly of the International Environmental Modeling and Software Society (IEMSS 2002), Lugano (Switzerland), 24-27 June 2002.

1st CEOP Asia-Australia Monsoon Project (CAMP) International Science Panel, Tokyo, 9 March 2002.

"*The Himalayas Reference Site*", CEOP Kick-off Meeting, Tokyo, 6-8 March 2002.

"*Study of Local and Large-Scale Monsoon Circulation in the Eastern Highland Himalayas*", 5th International Study Conference on GEWEX in Asia and GAME, Nagoya, 3-5 October 2001.

GAME-Tibet Synthesis, Nagoya, 2 October 2001.

6th GAME International Science Panel (GISP), Nagoya, Japan, 1-2 October 2001.

8th Scientific Assembly of the International Association of Meteorology and Atmospheric Sciences (IAMAS 2001), Innsbruck, 10-18 July 2001.

"*Meteorological Research at High-Altitude in the Himalayas*", Ev-K^2-CNR Project Meeting, Rome, 11 December 2000.

Interdisciplinary Summit of the Ev-K^2-CNR Project, Milan, 20 January 2000.